

What is claimed is:

1. A metal-coated cubic boron nitride abrasive grain comprising a cubic boron nitride abrasive grain, and a metal intruding into the cubic boron nitride abrasive grain.
2. A metal-coated cubic boron nitride abrasive grain according to claim 1, wherein the cubic boron nitride abrasive grain has a groove formed on the surface thereof, and the cubic boron nitride abrasive grain is coated with a metallic layer.
3. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the groove formed on the surface of the cubic boron nitride abrasive grain has a portion in which the ratio (w/d) of the width (w) of the portion to the depth (d) thereof is less than 1.
4. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the width (w) of the groove formed on the surface of the cubic boron nitride abrasive grain is in a range of 0.3 to 3  $\mu\text{m}$ , and the depth (d) thereof is in a range of 0.3 to 250  $\mu\text{m}$ .
5. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the groove formed on the surface of the cubic boron nitride abrasive grain has a portion in

which the ratio ( $w/L$ ) of the width ( $w$ ) of the portion to the length ( $L$ ) thereof is 0.1 or less.

6. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the groove, which is formed on the surface of the cubic boron nitride abrasive grain and has a portion in which the ratio ( $w/d$ ) is less than 1, has a length ( $L$ ) of 20  $\mu\text{m}$  or greater.

7. Metal-coated cubic boron nitride abrasive grains according to claim 1, wherein an average diameter of the cubic boron nitride abrasive grains is in a range of 40 to 1000  $\mu\text{m}$ .

8. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the metallic coating includes at least one layer selected from a group consisting of an electroplated nickel coating, an electroplated cobalt coating, an electroless-plated nickel coating, and an electroless-plated cobalt coating.

9. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the metallic coating includes at least one layer of an electroplated nickel coating or an electroless-plated nickel coating.

10. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein an outermost layer of the

metallic coating is an electroplated nickel coating or an electroless-plated nickel coating.

11. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the metallic coating is an electroplated nickel coating or an electroless-plated nickel coating.

12. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the metallic coating has a double-layer structure comprising a first layer of an electroless-plated nickel coating or an electroless-plated cobalt coating, a second layer of an electro-plated nickel coating or an electroless-plated nickel coating which has a composition different from that of the first layer.

13. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the metallic coating has a triple-layer structure comprising a first layer of an electroless-plated nickel coating or an electroless-plated cobalt coating, a second layer of an electroplated nickel coating, an electroless-plated nickel coating, an electroplated cobalt coating, or an electroless-plated cobalt coating which has a composition different from that of the first layer, and a third layer of an electro-plated nickel coating or an electroless-plated nickel coating which has a composition different from that of the second layer.

14. A metal-coated cubic boron nitride abrasive grain according to claim 2, wherein the ratio of the metallic coating to the entire metal-coated cubic boron nitride abrasive grain including the metallic coating is in a range of 20 to 80 wt.%.

15. Abrasive grains comprising the metal-coated cubic boron nitride abrasive grains according to claim 1 at a ratio in a range of 5 to 100 wt.%.

16. A method for producing metal-coated cubic boron nitride abrasive grains, comprising the steps of:

thermally treating cubic boron nitride abrasive grains at a highest treatment temperature of 900°C or higher, to thereby form grooves on the surfaces of the cubic boron nitride abrasive grains; and

coating the cubic boron nitride abrasive grains with metallic layers.

17. A method for producing metal-coated cubic boron nitride abrasive grains according to claim 16, wherein, in the step of thermal treatment, the cubic boron nitride abrasive grain is heated in an oxidizing atmosphere in which the highest treatment temperature is set in a range of 900°C to 1300°C.

18. A method for producing metal-coated cubic boron nitride

abrasive grains according to claim 16, wherein, in the step of thermal treatment, the cubic boron nitride abrasive grain is heated in a non-oxidizing atmosphere in which the highest treatment temperature is set in a range of 900°C to 1600°C.

19. A method for producing metal-coated cubic boron nitride abrasive grains according to claim 16, wherein, in the step of thermal treatment, the cubic boron nitride abrasive grain is heated at a temperature increasing rate of 6°C/min or greater at least in a range of 800°C to the highest treatment temperature.

20. A method for producing metal-coated cubic boron nitride abrasive grains according to claim 16, wherein, in the step of thermal treatment, the cubic boron nitride abrasive grain is heated at a temperature increasing rate of 6°C/min or greater in a range of 800°C to the highest treatment temperature, and then the treatment temperature is decreased to 800°C at a rate of 6°C/min or greater.

21. A method for producing metal-coated cubic boron nitride abrasive grains according to claim 16, wherein, in the step of thermal treatment, a retention time during which the cubic boron nitride abrasive grain is retained at the highest treatment temperature is set to be 60 minutes or less.

22. A metal-coated cubic boron nitride abrasive grain

produced using the method according to claim 16.

23. A resin bonded grinding wheel comprising the metal-coated cubic boron nitride abrasive grain according to claim 1.

24. A resin bonded grinding wheel comprising the abrasive grain according to claim 15.

25. A resin bonded grinding wheel comprising the metal-coated cubic boron nitride abrasive grains according to claim 22.